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Claim Status

Claims 1-20 (canceled).

Claim 21 (new): A phase-change memory device comprising:

- a. a pair of electrodes; and
- b. a resistive layer with a plurality of ultra-small resistive element, or
- c. a lamination of said resistive layer and conductive layer.

Claim 22 (new): The top surface and bottom surface of the said resistive elements in claim 21 contacts directly with the top and bottom electrodes, respectively.

Claim 23 (new): The device in claim 21 with lamination of resistive layer and conductive layer wherein the top surface and bottom surface contact with said adjacent conductor layer.

Claim 24 (new): The device of claim 21 wherein the resistive layer has a thickness in the range of about 1.0 to 100 nm.

Claim 25 (new): The device of claim 21 wherein the size of the resistive element is in the range of about 1.0-100 nm in diameter.

Claim 26 (new): The device of claim 21 wherein the material of electrode layer and the conductive layer in the lamination resistive element is selected from the high melting temperature metals, alloys and conductive compounds.

Claim 27 (new): The programming of the device of claim 21 includes a pulse current of short duration and higher current and a pulse current with longer duration and lower current.

Claim 28 (new): A programming metallization cell memory (PMCm) comprising:

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- d. a pair of electrodes; and
- e. a thin metal layer; and
- f. a single resistive layer with a plurality of ultra-small solid electrolyte resistive element, or
- g. a lamination of said resistive layer, thin metal layer and conductive layer.

Claim 29 (new): The top surface and bottom surface of the said solid electrolyte resistive elements in the claim 28 contact directly with the adjacent metal layer and bottom electrode, respectively.

Claim 30 (new): The device of claim 28 with lamination of resistive layer, thin metal layer and conductive layer wherein the top surface and bottom surface of said solid electrolyte element contact with adjacent said conductor layer and thin metal layer.

Claim 31 (new): The device of claim 28 wherein the size of the solid electrolyte resistive element is in the range of about 1.0-100 nm in diameter.